From mind to machine

let's get started..

Sunday, August 03, 2014

Homemade 12 Gauge Pipe Shotgun

This shotgun is a one of the simplest firearms that can be built. That said, **this is for educational purposes only. Do not attempt to build this gun!** The materials and ammunition are cheap and commonly available, and it can be made quickly with a minimum of tools.

Here is a live demo of it in action:

This firearm design was inspired by the infamous 4-winds shotgun and the Philippine guerrilla gun.

It utilizes the so-called "slam-bang", or blow forward, action. To fire, a 12 gauge shotgun shell is placed into the barrel, which is then slid into the receiver, and slammed rearward. A nail crushes the primer in the process. After firing, the barrel is removed, and the spent shell pulled out by hand.

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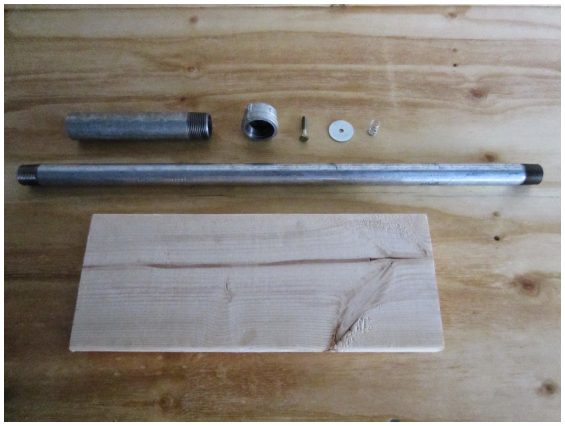
It is made from two pieces of steel plumbing pipe and an endcap: one pipe acts as the barrel, the other, larger diameter pipe and endcap as a receiver. A small piece of wooden dowel and a nail make up the hammer and firing pin. The stock is made from a length of ordinary 2x6 lumber (I think this is probably spruce).



To comply with US Federal Title 1 requirements: It has a barrel length of 19" (18" federal minimum) and an overall length of 35" (26" federal minimum).

The Receiver

The body of the receiver is made from a 1" diameter, 6" long, schedule 40 galvanized pipe nipple. This comes threaded on both ends. I cut off the threaded section on one end, this will be the front of the receiver that accepts the barrel. The threads on the other end will be used to attach a 1" pipe cap later. Two holes are drilled and tapped on the bottom to attach to the stock, and a hole is drilled and tapped on the side to provide the barrel lock/safety bolt.

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-87%
-90%
-84%

The most critical task for building the receiver is that the barrel freely slides all the way inside of it without sticking or binding. As purchased the two will not likely fit do to manufacturing tolerances and imperfections - the dimensions are very close. Either the barrel outside can be made smaller via grinding or sanding, or the receiver inside can be made bigger via sanding. Or, some combination of both.This is what I did.

One trick is to find a 1" pipe nipple that has no internal weld seam. Plumbing pipe of this kind is made by bending a flat piece of steel over a cylindrical mandrel and welding the two ends together to form the finished pipe. This creates a weld seam that is invisible on the outside but usually very obvious on the inside. This seam sticks out and interferes with the barrel's insertion. I have discovered that some pipe nipples have this weld bead ground off already inside, and some do not. It is possible to remove this seam oneself but it is time and labor intensive, and requires making a tool. The tool is a wooden dowel with coarse sandpaper glued to the outside.

It is much easier to slightly reduce the diameter of the barrel since it can be reached with tools. However care must be take not to make it too thin. This is covered below in the barrel section.

The Hammer/Firing Pin

The hammer is fixed at the rear of the receiver and relies on the barrel to bring the shell to it. It consist of a 1" diameter oak dowel that is cut to 1/2" in length. The firing pin is made from a roofing nail that is cut to 5/8" long with hacksaw. The tip of the nail is rounded over with a file to give a blunt profile. It is important not to use a sharp tip as it may pierce the primer instead of crushing it. A hole is drilled through the center of the dowel using a drill bit the same size as the roofing nail. Lastly, a piece of cardboard is cut to 1/8" larger in all directions than the oak dowel - this serves to keep the hammer and firing pin secure at the end of the receiver.

To assemble, the nail is punched through the center of the cardboard piece and fed through the hole in the dowel. The tip of the nail should slightly protrude above the dowel.

Then the hammer/firing pin are placed into the threaded endcap. The cardboard piece sticks into the threads of the end cap, preventing the hammer from falling out.

If if needs to be removed for replacement or cleaning a pair of needle-nose pliers works fine.

The Barrel

The barrel is a 19 inch long peice of 3/4-inch schedule 40 galvanized steel pipe. Black pipe could also be used here. If the steel pipe has threads they should be cut off on the breech side otherwise the chamber will be weak. This can be accomplished with a hacksaw. The barrel should not be shorter than 18" to comply with US federal legal requirements. 18.5" is a good minimum to observe. I made sure to square off the chamber end with a file so the lip of the shotgun shell would rest on the edge snugly.

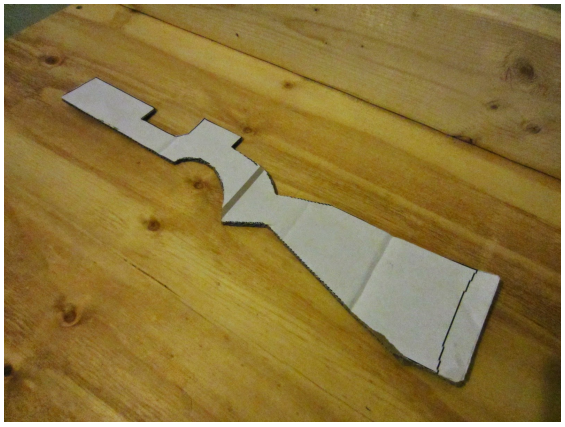
I made a slant compensator in the barrel by cutting the muzzle at a 45 degree angle with a hacksaw, then cleaning the cut up with a file. This in theory will reduce muzzle flip. An optional front bead sight was also made using a machine screw to give something to aim with. I drilled a hole and tapped for the threads, in this case 10-32. The screw is ground on the bottom to prevent it from protruding into and potentially obstructing the barrel, a dangerous condition for any firearm.

I polished/sanded the barrel near the breach end with a flap disk on a grinder until it slid easily into the receiver without sticking or binding. The trick here was to keep the grinder moving up and down the barrel and never remaining on one spot as you slowly move around the barrel.

I went very easy on the barrel, taking off a very small amount of material all the way around. Shotgun shells operate at relatively low pressure as far as firearms go. But his pipe is not rated for this kind of application. This design however sleeves barrel in another steel pipe during firing to give a some measure of safety.

Making the Stock

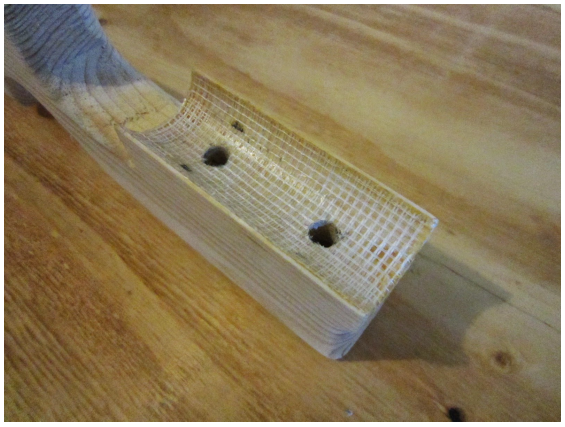
I made a basic stock design in MS Paint, scaled it up, and printed on two sheets of paper. This can all be done in the program itself. I then glued the sheets to a piece of cardboard and cut out them out. This created a template for tracing onto the 2x6. I found the stock a tad short and thin for my liking so I slightly changed the dimensions as I traced it to make everything bigger and longer.



The stock is cut out using a panel saw a section at the time. I shaped the edge of the stock using a router with a round-over bit. This could also be accomplished with 60 or 80 grit sandpaper, but much more slowly.

The stock is inlet for the receiver using a hole saw that is slightly smaller than the receiver. The next step was to wrap some sandpaper around the receiver and use it as a sanding block to bring the bed to correct size. I had to be careful to prevent the edges of the inlet area from cracking.

Once complete, I lined the bed of the receiver with some fiberglass tape and wood glue to reinforce the relatively fragile edges. The receiver was wrapped in aluminum foil as a release and clamped down onto the glue. If I were to do it again, I would used epoxy here instead. The glue isn't really ideal for bedding a stock (too soft), but it works well enough in a pinch.



3/8" holes are drilled to accommodate the two 3/8 bolts which will hold the receiver to the stock. These bolts are way overkill but they are what I had flying around. Much smaller bolts could be used. The stock has a wooden block in front of the endcap to provide some measure of safety to the user in the event the receiver end threads should fail - the end cap would not be blown directly into the user's face. This will be later reinforced with screws as it is not very strong - the grain of the wood runs front to back.

The bottom of the holes are counterbored with a big drill bit to recess the bolt heads. They must be tightened with a socket wrench.

The receiver was previously drilled and threads tapped in the holes. The bolts only engage the threads for the thickness of the receiver(maybe 1/8"), as the barrel needs to freely slide past them.

A few washers were added under the bolt heads to get the bolts to tighten up without going too far

into the receiver and blocking the movement of the barrel.

The receiver was then removed from the stock, and sanded lightly by hand. Two coats of gunstock stain are wiped on with a rag, with 4 hours between the coats.

Then three coats of polyurethane are applied with a very light scuff sanding between coats. 400 grit sandpaper was used and very little pressure was applied. A sanding block is used to keep from sanding through each coat.

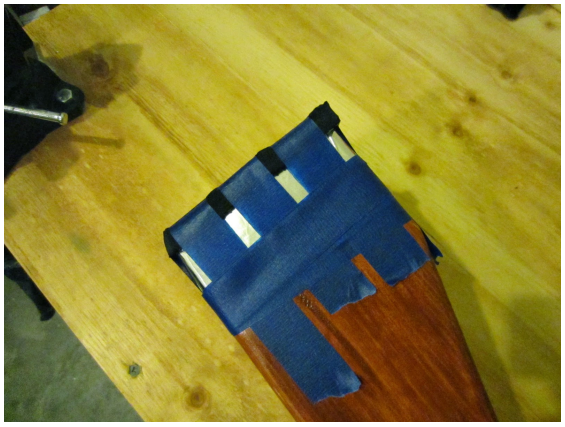
A rag was used to apply the poly. Several companies make "wipe on poly" specifically but the regular stuff worked just fine. At least 4 hours were given between the coats, and a fan was used to speed drying.

The finishing touch on the stock is the recoil pad to making shooting more comfortable. The recoil pad is made from a $2 pair of black walmart flip flops.

I placed the butt of the stock on the flip flop and traced with a permanent marker. I cut it slightly larger using a pair of scissors.

Next step was to drill some shallow holes in the buttstock to provide a good surface for gluing. Gluing to end-grain does not work well otherwise.

Then I ran aluminum tape around the butt-stock to prevent glue from getting on the finish, and to protect it from sanding of the pad later. I mixed some 5-minute epoxy, slathered it onto the stock, and pressed the recoil pad into place. I used some masking tape to hold tight while it cures.



After the epoxy cured, I sanded the foam with 60-grit sandpaper to get the desired rounded over shape. I also masked off the pad and stock afterwards and painted a 1/4" black band next to the pad.

This band helps hide my less than stellar sanding job on the pad/stock interface that exposed the raw wood. This would probably be less of a problem if I attached and sanded the pad *before* finishing the stock.

Final Assembly

The shotgun is assembled as shown:

The receiver is attached to the stock with the bolts, the endcap screwed and tightened onto the receiver end. The final step is to insert the barrel, and mark through the receiver bolt stop hole with a permanent marker, and then make a divot in the barrel using a drill. This divot allows the barrel to be securely "locked" when the bolt is screwed in. This is important as the barrel would otherwise fall out of the gun when carried.

I made a divot with the barrel fully pressed against the endcap, and then moved it forward half an inch for another divot. This way I can secure the barrel fully rearward (chamber empty), and forward slightly (shell chambered). This functions as somewhat of "safety" though should not really be relied on as such.

One optional but pretty useful feature would be a forward grip that attaches to the barrel. This would make it easier to slide it rearward and to hold the barrel when removing/inserting a shotgun shell. I may put one on in the future.

Scribed by mindtomachine at 7:03 AM

59 comments:

Joe Dungeon said...

I'm looking in on making a shotgun myself! Although, the shotgun I wish to make will hopefully include a trigger mechanism/external hammer.... Any advice? (Also, was it 3/4" diameter pipes that fit 12 gauge?)

2:10 PM

mindtomachine said...

You are going to need a locking mechanism of some sort. I'd go with a clone of a cobray terminator - that uses the same mechanism as this but has a trigger.

3/4 pipe 'fits' 12 gauge, but fair warning its a little loose.

Also check your local laws.

8:17 PM

Anonymous said...

what diameter would you suggest for a 28 gauge shell? or a .410?

6:58 AM

Anonymous said...

Bad idea. I just made one and the end cap exploded. Dont do it. I got lucky and only had a few powder burns. Dont do it. If i had held it any other way There would have been real injury or death. Dont do it. Buy a shotgun.

9:25 AM

Nathaniel Waters said...

Did you grind down the world seam in the barrel like you did to the receiver?

4:36 PM

Axel Schult said...

Please tell me what kind of Steel you must use fore this kind of Shotgun !

11:43 AM

Wang said...

Make sure you use schedule 40 to 80 seamless black pipe to be same. You do not want the pressure to blow where the seamline is. Only time steamed pipes are safe to use is if you have a barrel adapter or sleeve which itself is seamless with thick wall.

Endcap must be tightened very well.

10:51 PM

Wang said...

I've made one but I used a barrel sleeve that converts 12g to 410ga as seamless is very hard to obtain in my country.

10:53 PM

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10:56 PM

Bernice Parsons said...

This is a pretty wicked piece of machinery! And what's more amazing about it is that you could actually make one yourself, with materials that most of us already have in hour warehouse or garage. Thanks for sharing this cool project of yours with us!

Bernice Parsons @ Badger Anodising

12:42 PM

Matthew Pierce said...

You should put a laser and a fore grip on it.

1:19 AM

Rosemary Bailey said...

Wow! Your machineries are made by your own hand! I appreciate the fact that you are giving us instructions on how to make it, so we ourselves can make it too. Hahaha! Thanks in advance! These DIY procedures are really hard but executable. Yes, it's difficult but I think for something as handy as that, it's worth to give it try. In any ways thanks for sharing this one. Keep safe! :)

Rosemary Bailey @ Wabi Corp

5:53 AM

Da said...

Very stupid to make available such designs to an equally stupid public. Please delete this irresponsible article. I know you americans have this childish "right to bear arms" thing happening but publishing this crap will probably kill many innocent people in third world countries.

8:20 AM

Unknown said...

Wrap the barrel with twine. This will add a layer of protection.

9:56 AM

Akshara desai said...

This comment has been removed by a blog administrator.

2:38 AM

Unknown said...

Dont be but hurt cause you dont have freedom

8:23 PM

benjamin womble said...

How do random one shot homemade shotguns put together by American citizens in America (may I remind you that they are civilians, not military) kill "innocent people in third world countries?" This statement is just stupid due to the fact that for one thing there is no chance that an American soldier would shoot an "innocent person in a third world country" with a HOMEMADE GUN. Do some freaking research or at least take ten seconds before you post something stupid before you put it on the Internet and embaress yourself.

7:31 PM

Anonymous said...

Not that im agreeing with the guy but if you had read his post it didnt say anything about Americans or Soldiers he was reffering to third world terrorists or freedom fighters depending on your views using this to make their weapons.

2:44 PM

Anonymous said...

People in "third world countries" are too busy slaughtering each other with machetes and free machine guns given to them, why would they bother heading to Home Depot and building a shotgun they don't have any ammo for?

7:00 PM

Corsnet pipes said...

Thanks for the detailed and useful information shared by you in your blog. For more info visit http://www.corsnet.com/

1:01 AM

Anonymous said...

The guy, who said about "people in third world countries" meant that people of those countries will build similar guns and kill themselves because of bad quality of building materails. Well, I think, it's good - the number of idiots will be reduced.

10:07 PM

zmbkll-94 said...

Can you include a link to you test firing this. Its not bad on paper(internet) but how about in the real world. I would make this in a shtf situation but im thinking about getting the parts ready now. Even if its only use is for defending against looters it would make someone think twice. I would use my handgun after the first shot bc reload would be too long for any real scenario.

10:52 AM

Daniel Acevedo said...

Hey, really nice build. Has your dowel section broken in half? I know someone that used a screw instead of a nail and the dowel piece broke in half.

11:11 PM

Fatt Soon said...

Iron tube can made??

8:34 AM

Make Oscopy said...

We made two designs using steel pipes, one slam-fire and another a string-pull design with a hammer and a moving firing pin. You can see them here: https://www.youtube.com/watch?v=qGbl2MeoONg

12:16 PM

Ethan Griffith said...

We do have right to bear arms! I want you to think about something if you anti gun dumbtard was held at gun point and you had a choice of a sharp knife or a hand gun wich would you choose? Well you would probly go for the gun wouldn't you!better yet if you we're to call the cops what would they use to stop the gun man?that's right a GUN!!! you stupid dumbtards that dontbknow a thing about guns need to be put in a

situation we're you would need a gun! More crimes would be stopped if all people carried a gun at all times!I will pray for you anti gunners cause when the day come when a bad guy comes with gun you gonna be wishing a good guy would come with a gun

7:34 PM

Unknown said...

galvanized steel pipe

2:55 PM

Allen Startzman said...

Childish? Rights aren't childish and last time I checked American blood often gets shed to protect socialist pussys from third world countries

6:05 PM

Allen Startzman said...

Childish? Rights aren't childish and last time I checked American blood often gets shed to protect socialist pussys from third world countries

6:06 PM

Gary Turbo said...

"I want you to think about something if you anti gun dumbtard was held at gun point and you had a choice of a sharp knife or a hand gun wich would you choose?"

https://youtu.be/3Ps8iq-rwRg

12:17 PM

Gunner Jacky said...

It really seems to be dangerous, you mustn't take danger and take help from the licensed gun shop or firearms safety training classes and proper licensing to have these killer guns. You can also take help from the MA Gun License to get proper licensing and get safer and secure gun and most importantly a legal one.

12:16 AM

Anonymous said...

Anti-gun people would deserve to be rounded up and genocided by the likes of Stalin, Hitler, etc. Then they will learn their lesson of being pussy-cats in a world of lions and wolves.

8:53 AM

George said...

Very decent-looking shotgun. Love the stock, and the AK-47 style slanted muzzle...Recoil, however, would have to be absorbed by two bolts only 1/8" into the receiver, in sheer, and not the stock directly. I would suggest using only light trap and / or hand-loads... Obviously, the shotgun is designed for easy access to the end-cap for changes / repairs. How about a removable block of wood to fit between the pipe cap and the gun stock, to absorb recoil when using full-loads and 1 oz solids ?

6:38 PM

Anonymous said...

And that comment is why the world thinks we are all mentally insane.

6:36 AM

clothing store said...

This comment has been removed by the author.

9:21 PM

clothing store said...

Standard AISI 316 Stainless Steel Pipe/tube Seamless Or Welded

BUYNOW

Price : US $2600-3000
Minimum Order : 1 Ton
Location : China (Mainland)
Company : Wuxi Yaojia Special Steel Co., Ltd.
Response Rate :
Outer Diameter : 6-630mm
Thickness : 0.4-30mm
Application : chemical,metallurgy,boiler...
Steel Grade : 300 Series
Standard : ASTM,AISI,DIN,EN,JIS
Certification : ISO

steel Pipe
steel pipe industry
stainless steel pipe
sch40 steel pipe
carbon steel pipe dimensions table

BUYNOW

9:23 PM

Anonymous said...

I've never seen any of my guns get out of the armory, load itself and go on killing people...
Guns don't kill people, people with guns, kill people.
Besides i don't need a gun to kill anyone, something as simple as my shoelace is enough if you know how to use it..

1:46 PM

Anonymous said...

If you don't have a gun, I can kill you with my teeth. Should we all have our teeth pulled?

11:48 PM

KDUB Oath Keeper said...

So if you used galvanized that means you used electrical CONDUIT, not a thicker schedule as in water or gas high pressure PIPE. You are very lucky.

9:02 PM

Btibrands said...

Thank you for sharing on this shotgun Demo for sure I learn more from here. Golden Rod

2:23 AM

Yusef Khan said...

Excellent Blog, it is a awesome and thank you so much for sharing this awesome blog -

Best Online Headshops Usa

Best Online Glass Head Shop

head shop online

online headshop

cheap glass pipes

best head shop online usa

online headshop sale

online water bongs

2:44 AM

George Coffman said...

Can you make available the stock pattern?

10:28 AM

Anonymous said...

BS, any 3/4" pipe DOES NOT FIT 1" pipe. I checked all available at stores and they just don't fit

6:13 PM

Michael Z. Williamson said...

Blogger Gunner Jacky said...
It really seems to be dangerous, you mustn't take danger and take help from the licensed gun shop or firearms safety training classes and proper licensing to have these killer guns. You can also take help from the MA Gun License to get proper licensing and get safer and secure gun and most importantly a legal one.

~~

It's perfectly legal. If that's the best you can do for grammar, sentence structure and firearm law, I can't imagine why I'd bother consulting with you for anything.

~~~

Blogger Da said...
Very stupid to make available such designs to an equally stupid public. Please delete this irresponsible article. I know you americans have this childish "right to bear arms" thing happening but publishing this crap will probably kill many innocent people in third world countries.

~~

By "stupid public," you refer of course to yourself. We also have a right to freedom of the press, so no, he won't be deleting the article, and you can go F yourself.

And people in third world countries use this knowledge to make guns to defend themselves against gangsters and tyrants you Europhags enable and endorse.

12:05 AM

WELDING STOP said...

Nice Blog.
Useful information shared. I am very happy to read this Blog. Thanks for giving us nice info. Fantastic walk through. I appreciate this post.
Welding gage

3:14 AM

321 said...

It is legal and you don't need a license to own a shotgun in fact in most places you don't need a license for any gun unless it's to carry it

11:35 PM

fitting pipa hdpe said...

Wow.. That's so cool

10:25 PM

harrytommy said...

Interesting blog and I really like your work and must appreciate you work for the water pipes nice work.
water pipes

1:10 AM

Anonymous said...

"Democracy is two wolves and a lamb voting on what to have for lunch. Liberty is a well-armed lamb contesting the vote." Benji
~~~

;)

6:08 AM

Al Grayson Studio said...

Only a few inches of weld seam would need to be ground away in the breech, just enough for a 2-1/2" or 3" shell to be inserted easily.
The way the Filipino guns were made, the barrel was straight, not tapered, so that the barrel would go in either way. If a spent shell was stuck, the barrel was reversed and reloaded with a fresh shell. Firing it would blow the empty shell out of the (now) muzzle.
Do not tell your life insurance company that you fool around with stuff like this. The Filipinos were at war with a people who regarded them with contempt as "sub-human" and who intended to exterminate them. They had little to lose.

2:15 AM

Al Grayson Studio said...

The Russians, Chinese and others have flooded the third world with AKs, RPGs, etc. There is little need for historical curiosities like slam-bangs.

2:19 AM

Al Grayson Studio said...

Anti-gun states like Illinois and Massachusetts require Firearms Owner ID Cards to legally own guns.

2:22 AM

Al Grayson Studio said...

Deadly dental floss. Zip cord (small appliance cord). Handyman wire. All sorts of common household stuff is lethal. A broomstick, wooden or steel tube, will poke clear through a gut. Of course common kitchen knives. A brick. Half a brick. A high heel lady's shoe. Hammers, pliers, lamps, chair legs, the kid's softball bat.

2:29 AM

Al Grayson Studio said...

Until the next war. Then they can beg the insane Umurricuns to come rescue their pansy butts.

2:34 AM

Vinod Kumar said...

S.N ENTERPRISES was founded in the year 1990, by Mr. Naveen Arora and is the leading manufacturer of Hydraulic Pipe Bending Machines , Pipe Bending Die, Ball Mandrel, Wiper shoe, Receiving Gauge, Welding Fixtures, Brazing Fixtures. Visit:Pipe Bending Die

1:38 AM

Al Grayson Studio said...

Guns make killing much more convenient. It's not often that I see that a Stop-and-Rob has been knocked over by a hoodlum armed with a shoelace or teeth.
Pretending that guns are no more dangerous than any other possible weapon convinces no one and makes the sloganeer sound irrational even to gunnies.
If someone attacks me I would prefer a gun at hand rather than trying to unlace my shoe and threatening him with a deadly shoelace.

8:18 AM

pallavi vasal said...

S.N Enterprises also offers complete Pipe Bending services, End Forming services, Pipe Flaring services in material MS, Aluminum, ERW, Stainless Steel, Copper, Titanium and others. View More: Pipe Bending Services

11:28 PM

Dane Perry said...

That's right Merica!!!! Don't like it stay out, and go sip your latte and talk about socialist

values somewhere else!! Cuz we raise men here

2:54 PM

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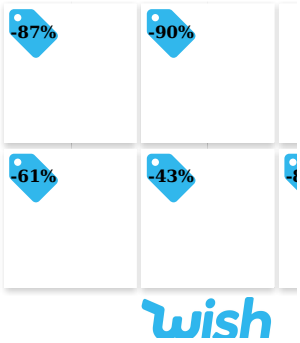

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